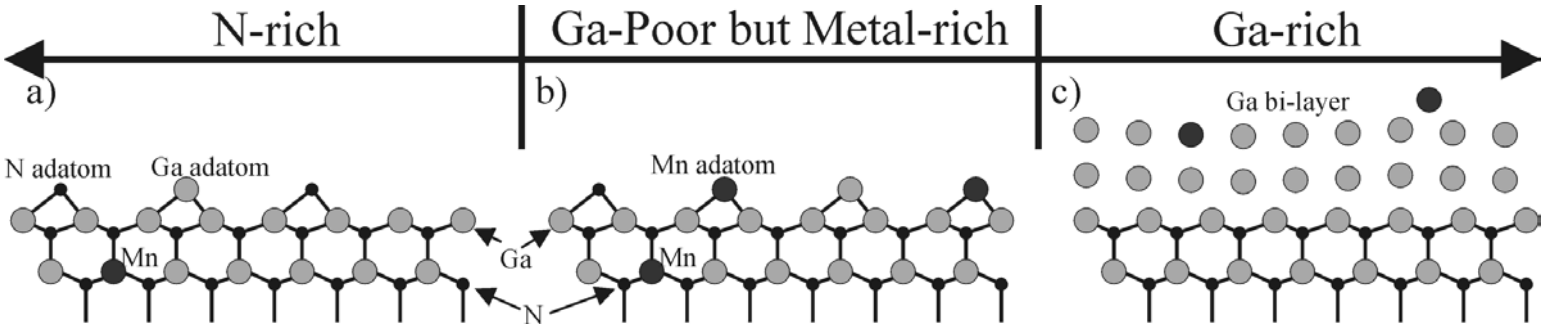
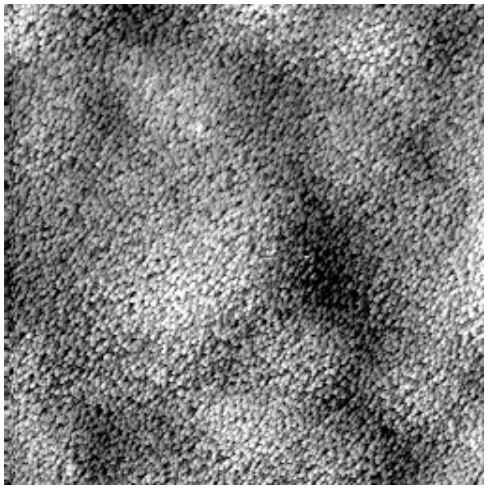
CAREER/PECASE: Growth and Analysis of Novel Nitride Semiconductor Systems

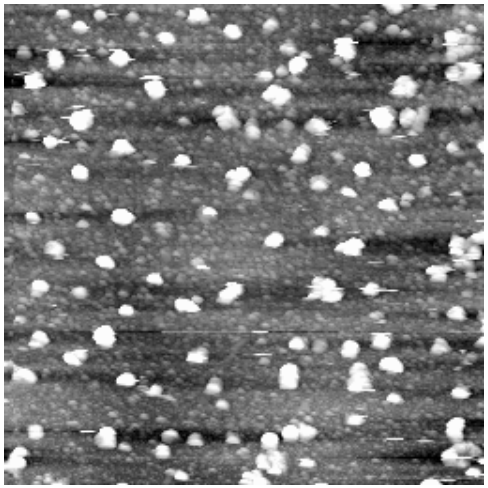
Arthur R. Smith, Ohio University, Athens, OH, DMR-9983816.

Growth of MnGaN Ternary Nitride Semiconductor: a Potential Spintronic Material

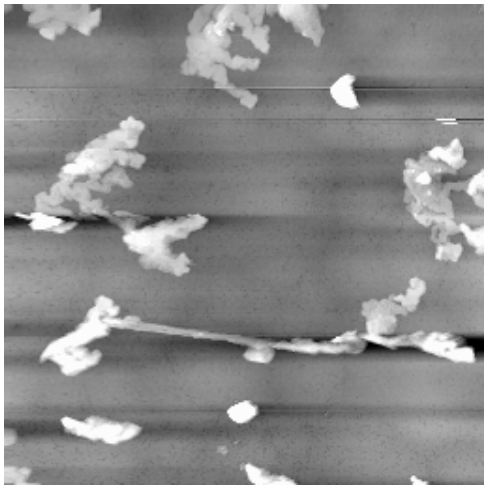




AFM image
40 μm x 40 μm



AFM image
20 μm x 20 μm



AFM image
40 μm x 40 μm

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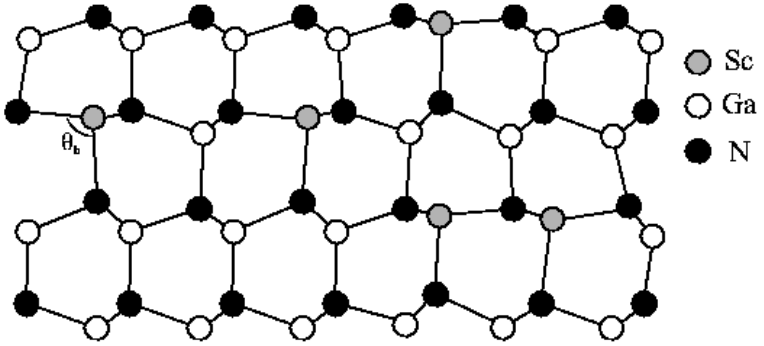
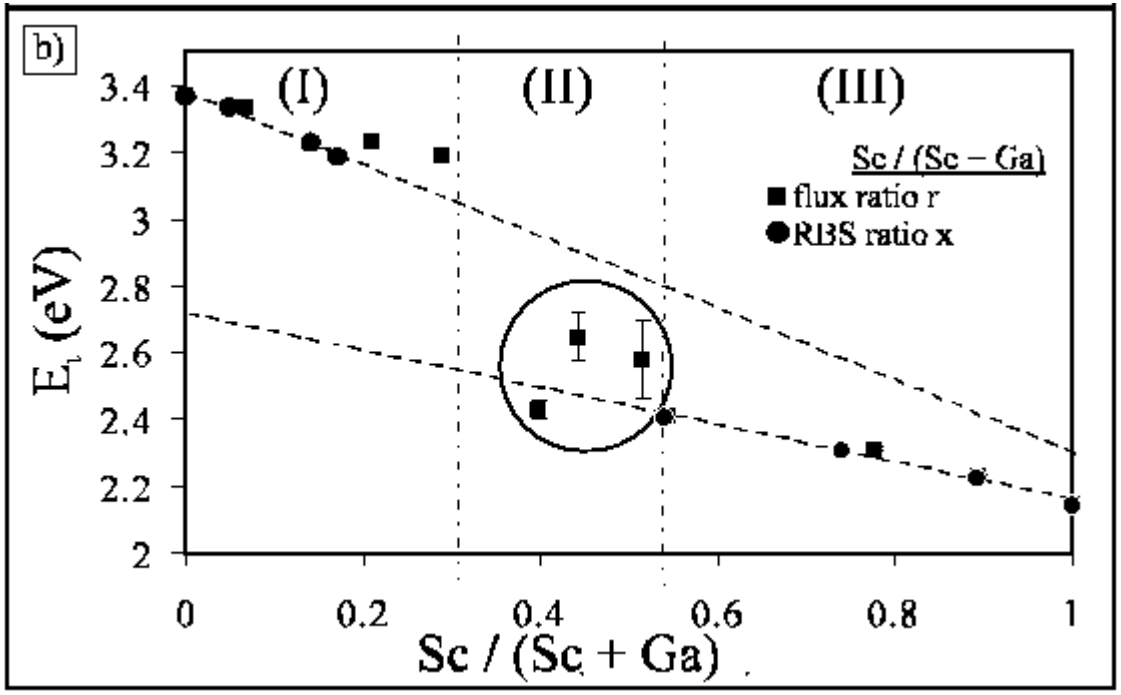
Investigation of ScGaN: a novel IIIB/IIIA Ternary Nitride Semiconductor

At right is presented a schematic model, based on experimental data, of ScGaN. Since ScN favors octohedral bonding, whereas GaN favors tetrahedral, a distorted structure is obtained at low Sc composition.





At left is shown the map of the direct optical transition for ScGaN as a function of the Sc fraction. Three regions are distinquished:

I. distorted wurtzite-like region
II. transitional region
III. rocksalt region